

IN-LINE SKATE WITH A SHOCK-ABSORBING DEVICE

BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention relates to an in-line skate, and particularly to an in-line skate that has a pivoting rear wheel bracket and a shock-absorbing device to significantly reduce impact shock to users.

2. Description of Related Art

With reference to Fig. 5, a conventional in-line skate with a shock-absorbing device has a boot body (not numbered) and a chassis (not numbered). The boot body has a bottom (not numbered), a toe (not numbered) and a heel (not numbered). The chassis has a sole (40), a toe bracket (41), a heel bracket (42), a wheel frame (50), multiple wheels (51) and a shock-absorbing device (60).

The sole (40) is attached to the bottom of the boot body (not numbered) and has a bottom face (not numbered), a front end (not numbered) and a rear end (not numbered). The toe bracket (41) is attached to the bottom face at the front end and has a distal end (not numbered) connected to the wheel frame (50). The heel bracket (42) is attached to the bottom face at the rear end and has the shock-absorbing device (60) attached to and mounted between the heel bracket (42) and the wheel frame (50). The wheel frame (50) has a front end (not numbered) and a rear end (not numbered), and the multiple wheels (51) are rotatably mounted in the wheel frame (50). The front end of the wheel frame (50) is pivotally connected to the distal end of the toe bracket (41). The shock-absorbing device (60) is mounted vertically

1 between and attached to the rear end of the wheel frame (50) and the heel
2 bracket (42) to keep shocks from being transmitted to the boot of the in-line
3 skate.

4 However, the conventional in-line skate with the vertically mounted
5 shock-absorbing device has the following drawbacks:

6 1. The shock-absorbing device only eliminates vibration and shock
7 applied to the sole in a Z direction, wherein the rear end of the sole moves up
8 and down. However, vibration in an X direction is not affected, which causes
9 potential sport injuries to users' ankles.

10 2. The in-line skate is unstable because the perpendicular distance is
11 quite long, which extends from a pivoting joint between the toe bracket (41)
12 and the wheel frame (50) to the shock-absorbing device (60). Therefore, a
13 little force applied to the in-line skate generates a large torque that impacts
14 the users and causes instability.

15 The present invention provides a modified in-line skate with a shock-
16 absorbing device to eliminate or obviate the drawbacks of the conventional
17 in-line skate.

18 SUMMARY OF THE INVENTION

19 The main objective of the present invention is to provide an in-line
20 skate with a shock-absorbing device that efficiently decreases impact and
21 vibration applied to the in-line skate from being transmitted to a person
22 wearing the skate.

23 Further benefits and advantages of the present invention will become
24 apparent after a careful reading of the detailed description in accordance with

1 the drawings.

2 BRIEF DESCRIPTION OF THE DRAWINGS

3 Fig. 1 is a side view in partial section of an in-line skate with a
4 shock-absorbing device in accordance with the present invention;

5 Fig. 2 is a partially exploded perspective view of a chassis in the in-
6 line skate in Fig. 1;

7 Fig. 3 is an enlarged side view in partial section of the in-line skate
8 in Fig. 1;

9 Fig. 4 is a side view of another embodiment of the in-line skate with
10 a shock-absorbing device in accordance with the present invention; and

11 Fig. 5 is side view of a conventional in-line skate with a shock-
12 absorbing device in accordance with the prior art.

13 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

14 With reference to Figs. 1 and 4, an in-line skate with a shock-
15 absorbing device in accordance with the present invention comprises a boot
16 (not numbered) and a skate chassis (not numbered). The boot has a bottom
17 (not numbered). The chassis is attached to the bottom of the boot and
18 comprises a wheel frame (10), multiple front wheels (12), a rear wheel
19 bracket (20), a rear wheel (24) and a shock-absorbing device (30).

20 The wheel frame (10) has a top surface (not numbered), a bottom
21 surface (not numbered), a front end (not numbered), a rear end (not
22 numbered), a middle (not numbered) and a front wheel well (11A, 11B). The
23 boot is attached to the top surface of the wheel frame (10). The front wheel
24 well (11A, 11B) is formed on the bottom surface of the wheel frame (10) at

1 the front end, and the multiple front wheels (12) are mounted rotatably in a
2 line in the front wheel well (11A, 11B).

3 The rear wheel bracket (20) has a proximal end (21), a distal end (not
4 numbered), a rear wheel well (23) and an optional brake (25) and is attached
5 pivotally to the wheel frame (10) near the middle and extends toward the rear
6 end of the wheel frame (10). The rear wheel well (23) is formed near the
7 distal end. The rear wheel (24) is rotatably mounted in the rear wheel well
8 (23). The optional brake (25) is attached to the distal end of the rear wheel
9 bracket (20), is a cylindrical abrasive block made of rubber and is selectively
10 pressed against the ground to provide a braking capability to the in-line skate.

11 The shock-absorbing device (30) is attached pivotally to the rear end
12 of the wheel frame (10) and the rear wheel bracket (20) at an angle other than
13 perpendicular and damps the movement of shock and absorbs shock applied
14 to the rear wheel bracket (20). Because the rear wheel bracket (20), the wheel
15 frame (10) and the shock-absorbing device (30) are connected pivotally at
16 angles, the wheel frame (10) and the shock-absorbing device (30) transmit
17 and absorb vertical and horizontal elements of shock to keep the skate stable
18 in movement.

19 With reference to Figs. 1, 2 and 3, the wheel frame (10) in a
20 preferred embodiment of the in-line skate with a shock-absorbing device in
21 accordance with the present invention has a middle recess (14), two pin holes
22 (15), a pivot pin (16) and an eye bracket (13). The middle recess (14) is
23 defined in the bottom surface in the middle between the front end and the
24 rear end and forms two outer walls (not numbered) in the wheel frame (10).

1 The two pin holes (15) are defined respectively in the two outer walls and are
2 aligned. The pivot pin (16) is mounted in the pin holes (15). The eye bracket
3 (13) is formed on the bottom surface of the wheel frame (10) near the middle
4 recess (14) between the middle recess (14) and the rear end.

5 The rear wheel bracket (20) has a top (not numbered), a through hole
6 (22), a vertical limit (not numbered) and an eye bracket (26). The through
7 hole (22) is defined in the proximal end (21) of the rear wheel bracket (20).
8 The proximal end (21) is pivotally mounted in the middle recess (14) so the
9 through hole (22) aligns with the two pin holes (15) in wheel frame (10). The
10 pivot pin (16) passes through the through hole (22) to pivotally attach the
11 rear wheel bracket (20) to the wheel frame (10). The vertical limit is formed
12 on the top of the rear wheel bracket (20) between the proximal end (21) and
13 the distal end to absolutely limit the vertical travel of the rear wheel bracket
14 (20) by abutting the bottom surface of the wheel frame (10). The eye bracket
15 (26) is formed on the top of the wheel bracket (20) forward of the vertical
16 limit.

17 The shock-absorbing device (30) is a spring-type shock absorber (not
18 numbered), is mounted pivotally and obliquely between the rear end of the
19 wheel frame (10) and the rear wheel well (23) and has a proximal end (not
20 numbered), a distal end (not numbered), two eyes (31, 32) and two pivot pins
21 (33, 34). The eyes (31, 32) are formed respectively on the proximal and
22 distal ends. One eye (31) on the proximal end is connected pivotally to the
23 eye bracket (13) on the wheel frame (10) with one pivot pin (33). The other
24 eye (32) on the distal end is connected pivotally to the eye bracket (26) on

1 the rear wheel bracket (20) with another pivot pin (34). Thereby, the spring-
2 type shock absorber absorbs vertical components (Z-direction) and
3 longitudinal components (X-direction) of shock applied to the in-line skate.

4 With reference to Fig. 4, another embodiment of the in-line skate
5 with a shock-absorbing device in accordance with the present has a front
6 wheel well (11B) that is dome-shaped and rotatably accommodates three
7 wheels (12) in line.

8 The in-line skate with a shock-absorbing device as described has the
9 following advantages.

10 1. The shock-absorbing device (30) is mounted pivotally and
11 obliquely between the rear end of the wheel frame (10) and the pivotally rear
12 wheel bracket (20) so the shock-absorbing device (30) longitudinally and
13 vertically absorbs shock momentum. Therefore, vibration is significantly and
14 quickly absorbed to eliminate sport injuries to people's ankles caused by
15 vibration.

16 2. The distance from the pivot point to the farthest wheel is much
17 shorter than the distance in the conventional one in-line skate, since the rear
18 wheel bracket (20) is attached to the wheel frame (10) at the middle recess
19 (14). Since the distance is shorter, the moment applied to the in-line skate by
20 a shock will be less, and the in-line skate will be more stable.

21 Although the invention has been explained in relation to its preferred
22 embodiment, many other possible modifications and variations can be made
23 without departing from the spirit and scope of the invention as hereinafter
24 claimed.